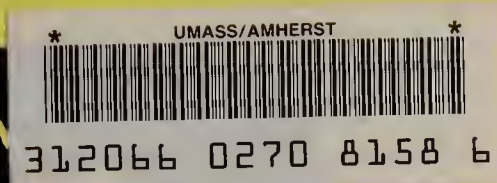


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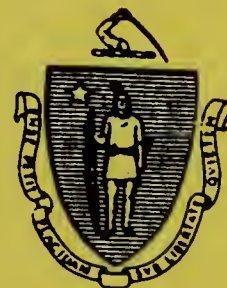
**INVENTORY OF LOCAL REGULATIONS
PERTAINING TO WATER QUALITY
IN BUZZARDS BAY**

**SOUTHEASTERN REGIONAL PLANNING AND
ECONOMIC DEVELOPMENT DISTRICT**

BBP-88-01



The Buzzards Bay Project is sponsored by The
US Environmental Protection Agency and The Massachusetts
Executive Office of Environmental Affairs





THE BUZZARDS BAY PROJECT

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FOREWORD

In 1984, Buzzards Bay was one of four estuaries in the country chosen to be part of the National Estuary Program. The Buzzards Bay Project was initiated in 1985 to protect water quality and the health of living resources in the bay by identifying resource management problems, investigating the causes of these problems, and recommending actions that will protect valuable resources from further environmental degradation. This multi-year project, jointly managed by United States Environmental Protection Agency and the Massachusetts Executive Office of Environmental Affairs, utilizes the efforts of local, state, and federal agencies, the academic community and local interest groups in developing a Master Plan that will ensure an acceptable and sustainable level of environmental quality for Buzzards Bay.

The Buzzards Bay Project is focusing on three priority problems: closure of shellfish beds, contamination of fish and shellfish by toxic metals and organic compounds, and high nutrient input and the potential pollutant effects. By early 1990, the Buzzards Bay Project will develop a Comprehensive Conservation and Management Plan to address the Project's overall objectives: to develop recommendations for regional water quality management that are based on sound information, to define the regulatory and management structure necessary to implement the recommendations, and to educate and involve the public in formulating and implementing these recommendations.

The Buzzards Bay Project has funded a variety of tasks that are intended to improve our understanding of the input, fate and effects of contaminants in coastal waters. The Project will identify and evaluate historic information as well as generate new data to fill information gaps. The results of these Project tasks are published in this Technical Series on Buzzards Bay.

This report represents the technical results of an investigation funded by the Buzzards Bay Project. The results and conclusions contained herein are those of the author(s). These conclusions have been reviewed by competent outside reviewers and found to be reasonable and legitimate based on the available data. The Management Committee of the Buzzards Bay Project accepts this report as technically sound and complete. The conclusions do not necessarily represent the recommendations of the Buzzards Bay Project. Final recommendations for resource management actions will be based upon the results of this and other investigations.



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THE BUZZARDS BAY PROJECT

INVENTORY OF LOCAL REGULATIONS PERTAINING
TO WATER QUALITY IN BUZZARDS BAY

APRIL 1987

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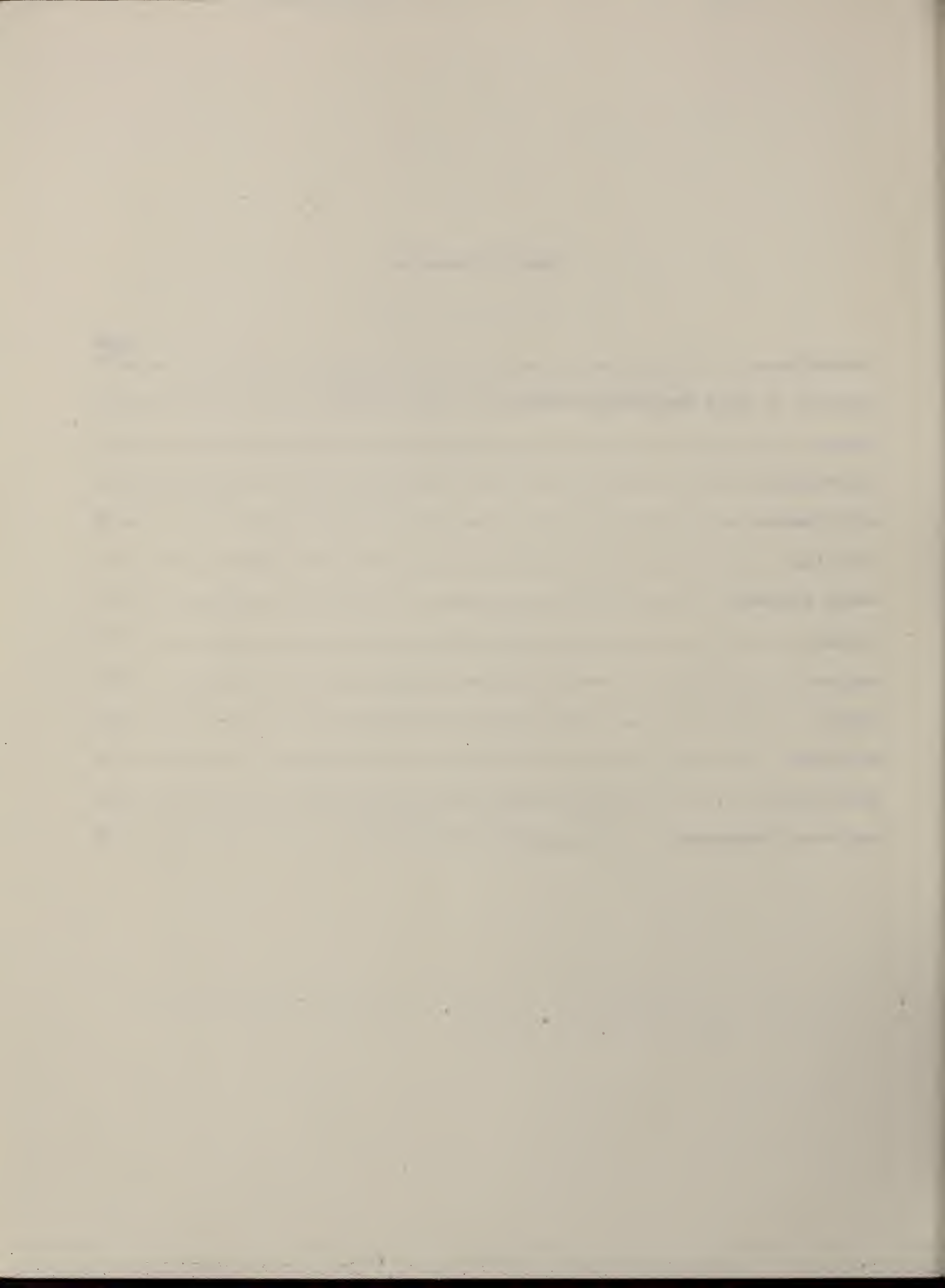
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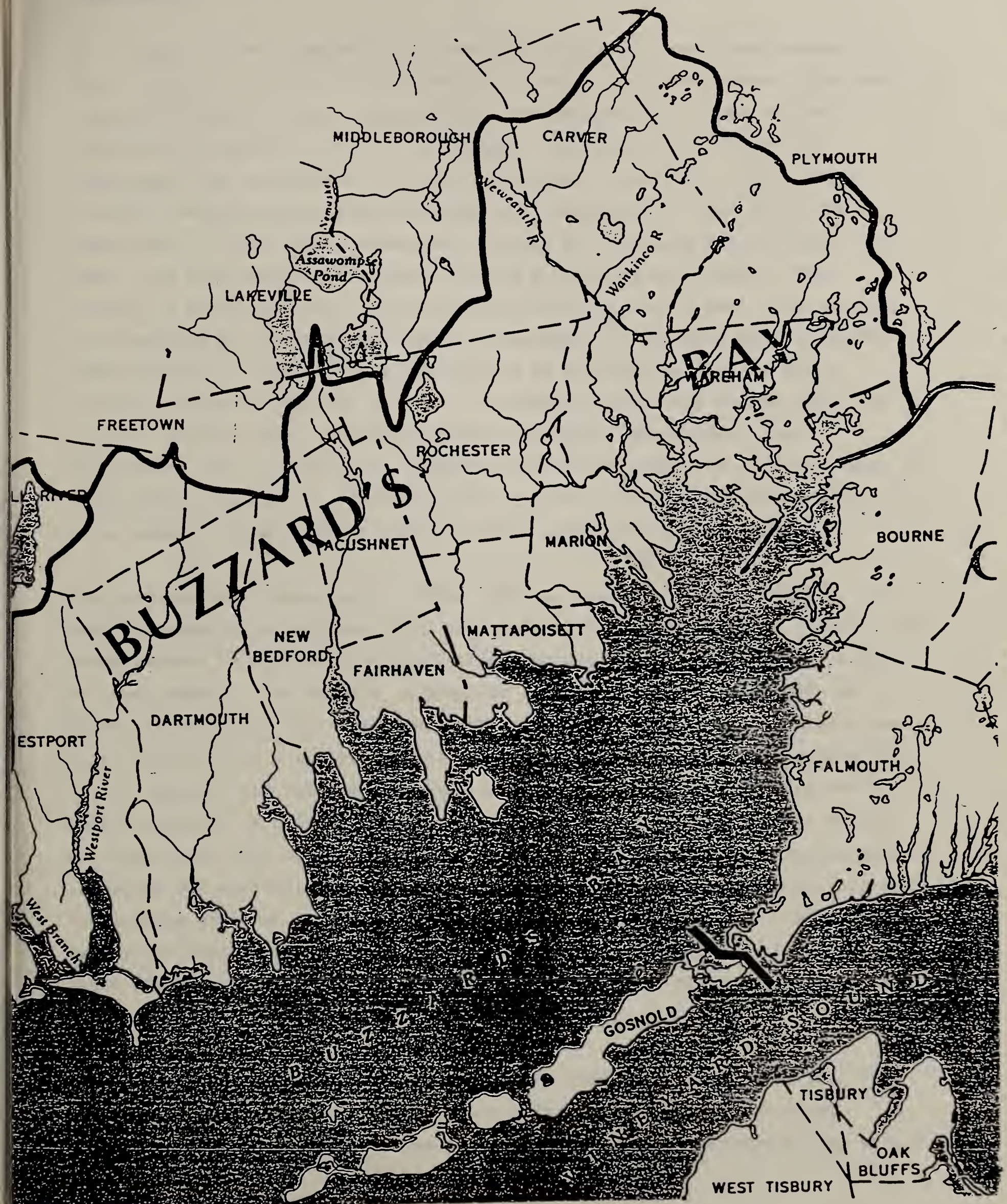
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BUZZARDS BAY DRAINAGE BASIN





Introduction

As a result of the Commonwealth's home rule tradition, local governments in Massachusetts may exercise considerable authority over development, land use, and public health issues. Consequently, the management of land and water resources effecting the quality of Buzzards Bay depends heavily on the development and enforcement of local bylaws and regulations. This project involved the collection, summarization, and comparison of municipal laws and regulations of the sixteen communities within the Buzzards Bay drainage basin. These laws were analyzed for water quality protection provisions. Point sources of water pollution are not addressed within this report, because they are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process. This analysis has allowed us to describe what is being regulated by municipalities and what is regulated primarily by the state, as well as to detail how these regulations vary among communities. Our comparisons have allowed us to identify some of the strengths and weaknesses of these local regulations. This will lead the way for suggested improvements in local means of water quality protection and water resource management.

Some general conclusions may be drawn from our studies. First, there is not enough communication between local officials within municipalities. Boards are often unaware of each other's regulations and may adopt contradictory policies or requirements. For example, a planning board may require developers to direct storm runoff into stream channels while the conservation commission may require detention/retention basins. According to MGL Chapter 40, Section 23, : "... (a) copy of all rules and regulations made by town boards or officers for which a penalty is provided by law shall be filed with the town clerk within ten days after they take effect." In practice, copies of laws or regulations are often not available from town clerks. In addition, permit regulations and requirments are even more difficult to obtain from the many part-time board members or their staff. This lack of availability of regulatory information makes planning by citizens and applicants difficult and reporting of violations unlikely.

Second, once local bylaws and regulations are obtained, it is found that they often mimic state regulations and do not authorize any additional local requirements. Of the local bylaws and ordinances which do expand on the powers

granted by the state, many describe the purpose of the law and extent of jurisdiction, but fail to outline performance standards. The granting of control without specifying the requirements of the law gives a great deal of discretionary power to local officials. This is particularly true of the special permit process. Many land use activities may be allowed by special permit granted by the zoning board of appeals, building inspector, soil board, or other designated authority. Frequently the Special Permit Granting Authority (SPGA) is an appointed board which does not formally adopt standards or policy guidelines for the issuance of permits. This lack of accepted standards may allow unjustified inconsistencies or favoritism.

The Inventory also shows the extent of variations among local regulation of water quality. From the matrix on the following page, it can be seen that some municipalities, such as Acushnet, Gosnold, Mattapoisett and New Bedford, have very little additional local regulation and rely almost solely on state regulations (enforced by local boards) to protect their water resources. Other communities, such as Bourne, Dartmouth, Fairhaven and Falmouth have surpassed state regulations by adopting more stringent controls over activities impacting water quality. Generally, the communities without professional staff assistance for their boards have not implemented supplementary local regulations. This is usually due to a lack of funds and personnel, which makes it difficult for the largely volunteer boards to keep up with current workloads and unlikely for boards to adopt additional requirements.

This report summarizes and compares local water quality related regulations, grouped into the following categories:

- zoning
- subdivision
- earth removal
- landfill
- sewage disposal
- wetland protection
- aquifer protection
- harbor
- shellfish
- agriculture
- hazardous material

INVENTORY OF LOCAL REGULATIONS RELEVANT TO WATER QUALITY

	ACUSHNET	BOURNE	CARVER	DARTMOUTH	FAIRHAVEN	FALMOUTH	FREETOWN	COSKOLD	MARION	MATTAPANSETT	MIDDLEBOROUGH	NEW BEDFORD	PLYMOUTH	ROCHESTER	WAREHAM	WESTPORT
Zoning	Bylaw	*	o	*	*	*	o	-	*	o	*	o	*	o	*	o
Subdivision	o	*	o	o	o	*	o	-	o	o	o	o	o	o	o	o
Earth Removal	--	o	o	o	*	*	o	-	o	o	Bylaw	-	o	o	o	o
Landfills	--	*	--	o	*	*	o	-	-	*	-	-	*	-	-	-
Wetlands	--	--	o	Bylaw	--	Bylaw	*	-	-	-	o	-	*	Bylaw	*	-
Aquifer	--	*	--	*	*	*	--	-	*	-	*	-	*	-	*	-
Harbor	--	o	--	o	*	*	--	o	o	-	-	o	*	-	*	-
Shellfish	--	o	--	o	o	o	--	o	o	o	-	o	o	-	o	o
Agriculture	--	*	*	*	*	o	*	-	-	-	-	-	o	-	-	-
Hazardous Materials	--	*	--	o	*	--	*	-	*	-	-	-	*	-	-	-
Sewage	--	*	*	o	*	*	*	-	o	-	*	-	-	-	*	*

--Indicates that the municipality has no local regulation for this function but enforces state law wherever authorized.
oIndicates that the municipality regulates this function; however, the regulations do not address water quality.
*Indicates that the municipality regulates this function and that regulations address water quality protection.

Wherever possible, strengths and weaknesses were highlighted to suggest changes which may make these regulations more effective. The Buzzards Bay Project will be making more complete suggestions for local action based on existing regulations, historic technical information, and new data. As part of this project, SRPEDD will produce a manual for municipal officials, including model bylaws and sources of technical assistance. The problem of enforcement is beyond the scope of this report; however, future recommendations will take into account the practicality of enforcement. Copies of these regulations are available, for the price of copying, from SRPEDD.

Zoning

Zoning is the principal form of municipal land use control authorized by M.G.L. Chp. 40A. Most municipalities have at least three types of zoning: residential, commercial, and industrial. Several towns have protective bylaws which specify the conditions for residential development and funnel all other forms of development through the zoning board of appeals special permit process. Zoning regulations specify lot size, shape and dimensions, the density of structures, frontage, parking and height requirements, and, most importantly, the land usage.

Municipalities generally have several types of residential districts. They vary from rural residential, allowing only large lot single-family homes, to districts which permit a mixture of multi-family housing and businesses. Commercial districts usually consist of a wide variety of businesses and residential uses, while industrial districts allow manufacturing and warehousing but prohibit residential development. Several municipalities have unrestricted or general districts which do not prohibit any category of land use. In addition, communities have added village commercial, agricultural, marine/waterfront, wetlands, aquifer, and other zoning district to better define and control development and land use patterns. Wetland districts are usually the most strict—prohibiting structures for human occupation, structures with sewerage facilities, and earth removal or filling activities. Rural residential or agricultural districts generally allow single low-density family dwellings, farms, and home occupations. Village or neighborhood districts permit a concentrated mixture of residential and small business use, to encourage village centers and discourage sprawling development. Some

municipalities have adopted zoning bylaws to allow clustering or planned unit development (PUD), which encourages reduced lot sizes in exchange for community open space land, including agricultural, wooded, or recreational areas. Marine or waterfront districts set aside areas for water-dependent uses, such as boat yards, cargo terminals, energy facilities, and marine-related industries. Some marine districts also encourage growth of the tourist industry by allowing restaurants, hotels, and recreational facilities.

Zoning regulations on wetlands, aquifers, and landfills are addressed in their respective sections. The following are examples of marine or waterfront zoning districts:

- Bourne--Scenic Development District

The purpose is to preserve or enhance highway views of the canal or ocean and encourage tourism. Height and lot coverage restrictions apply to signs or structures which could block visual access. Housing, restaurants, hotels, offices, and gift shops are allowed land uses.

- Falmouth--Marine District

Marinas and agriculture are permitted. Community services such as beaches, wharves, churches, schools, libraries, and museums are allowed. Scientific research may be allowed by special permit. Residential, commercial, and industrial use is prohibited.

- Marion--Marine Business District

Residential and most commercial uses are allowed. Junkyards, supermarkets, manufacturing firms, and industry are prohibited. Scientific research may be allowed by special permit.

- Mattapoisett

Waterfront District allows residential use and home occupations. Clubs and medical facilities may be allowed by special permit.

Marine Residence District allows those uses permitted in the waterfront district in addition to hotels and marinas.

- New Bedford--Waterfront Industrial District

This district sets aside land for water dependent business uses, such as shipping and freight, fish processing or distribution, and energy facilities.

- Plymouth

Light Industrial/Waterfront District is designed to encourage the development of marine-related industries and water-dependent commercial activities. Allowed uses include freight terminals, warehousing and distribution facilities, offices, research laboratories, boat sales and service, ramps and decks, ferrying, sightseeing, marine supply outlets, and fishing-related uses. Certain other uses are allowed by special permit.

The waterfront district is intended to encourage marine, history, or tourism-related land uses. Allowed uses include boat sales or service, docks, ferrying, sightseeing, seafood outlets, and commercial fishing. Restaurants, recreational facilities, hotels, specialty shops, and residences may be authorized by special permit. Industrial and most commercial uses are prohibited.

- Wareham--Marine District

Allowed uses include marinas, docks, boatyards, marine research, residences, and agriculture.

Zoning regulations enable municipalities to control development according to land use suitability and compatibility of uses. Zoning may also be used to set aside areas for specific uses to ensure that aspects of the community, such as historical areas, rural character, and fishing villages, may be preserved. Municipalities may use marine/waterfront zoning districts to keep areas available for water-dependent uses or tourism, and to prevent the loss of waterfront areas to more profitable housing development. In order to review

and make appropriate changes in their zoning bylaws, communities may consider adopting a temporary building moratorium. This will enable local boards to avoid the inevitable rush of permit applications which occurs whenever zoning changes are implemented. The Town of Freetown passed a two-year moratorium on new construction and plans to review and upgrade their zoning within this time.

In addition to defining allowed land usage, zoning regulations specify minimum lot sizes and allowable percentage of lot coverage by structures. The density of development affects water quality by impacting aquifer recharge, flooding, contamination of stormwater runoff, and in unsewered areas through septic system effluent. Residential minimum lot sizes and maximum percentages of lot coverage vary in the Buzzards Bay region, from 4,800 square feet with 50% coverage in urban New Bedford, to 3 acres for single-family homes in Wareham's agricultural watershed district. Lot size and coverage requirements generally differ in each of the zoning categories (see table on following page).

Lot size may also vary according to the density of use. For example, residential and commercial districts may include a base minimum lot size with additional space requirements per unit. To further ensure that lot size is adequate for on-site sewage disposal, the Town of Wareham requires larger lots in unsewered areas. Multi-family housing in unsewered areas must have a 40,000 square foot base, while sewerred areas must have a 30,000 square foot base lot size. Beyond this base amount, each unit requires an additional 15,000 square feet. Similarly, the lot size in commercial districts is 10,000 square feet if sewerred and 30,000 square feet if unsewered.

Past zoning was determined by historical land use, infrastructure availability (roadways, sewer, water, and utilities) and local opinion, without careful consideration of land use suitability factors such as soils, hydrology, or socio-economic factors such as conservation of agriculture, open space, recreation, and public access to waterways. Local boards should consider the following recommendations to optimize the effectiveness of their zoning bylaws:

- Each municipality should give priority to the review of their zoning bylaws to check for the compatibility of allowable land uses and densities with present knowledge of water quality protection.

ZONING --
MINIMUM LOT SIZES BY SQUARE FOOT (43,560 sq. ft. = acre)
MAXIMUM PERCENTAGE OF LOT COVERAGE BY STRUCTURE

<u>MUNICIPALITY</u>	<u>RANGE OF</u>		<u>MULTI-FAMILY RESIDENTIAL</u>	<u>BUSINESS/COMMERCIAL</u>	<u>INDUSTRIAL</u>
	<u>SINGLE-FAMILY</u>	<u>RESIDENTIAL</u>			
Acushnet	30,000		30,000	30,000	30,000
Bourne	40,000 to 80,000 10%		20,000 20%	13,000 50%	40,000 25%
Carver	60,000 20%		60,000 20%	40,000 50%	40,000 50%
Dartmouth	40,000 to 80,000 40%		10,000-11,250/unit or 15,000 40%	20,000 65%	43,560 50%
Fairhaven	15,000 to 30,000		3,000/unit plus 500/bedroom or 30,000 = 30-50%	15,000 60%	30,000 60%
Falmouth	20,000 to 80,000 20-35%		20,000	40,000 35-70%	40,000 to 80,000 40%
Freetown	70,000		70,000 plus 30,000/unit	70,000	70,000
Marion	15,000 to 80,000		by special permit	15,000	15,000
Mattapoisett	20,000 to 40,000		10,000	25%	25%
Middleborough	25,000 to 60,000		20,000/unit 25%	no minimum lot size	no minimum lot size
New Bedford	4,800		6,000/2 units, 10,000/3+ units 50%	-- 50%	-- 50%
Plymouth	40,000 to 60,000 25% 15%		15,000 to 55,000 25%	20,000 30-50%	20,000 to 40,000 50%
Rochester	65,000 20%		not allowed	65,000 20%	40,000
Wareham	30,000 to 130,680		650/unit or 30,000 plus 15,000/unit if sewer; 40,000 plus 15,000/unit if unsewered	10,000 if sewer 30,000 if unsewered	--
Westport	60,000		80,000 (2 units) plus 20,000/additional unit	60,000	60,000

- Zoning should encourage the proper siting of potential pollution sources such as landfills, heavy industry, junkyards, and service stations.
- Resource protection zoning for aquifer areas and wetland areas should be adopted to protect drinking water supplies and valuable wetlands.
- Communities should also consider enacting zoning districts for preserving desirable land use characteristics such as historic, waterfront, or rural/agricultural districts.
- Finally, Zoning Boards of Appeal should adopt guidelines and performance standards for the issuance of special permits and the granting of variances from zoning requirements.

Subdivision

Planning boards are required to adopt rules and regulations for the local administration of the Subdivision Control Law, M.G.L. Chapter 41, Section 81K-81GG. This law applies to land on which new roads are being added to obtain access to one or more lots lacking adequate frontage. Subdivisions may include commercial or industrial parks and residential developments.

Subdivision regulations specify standards for the construction of roadways, utilities, curbs, sidewalks, and other aspects of street or building layout.

In addition, these regulations contain requirements for drainage which affect flooding, local quantities and patterns of surface and sub-surface water flow and water quality. Development increases the impervious surface area and thus may increase surface runoff while decreasing recharge to groundwaters. Runoff from roofs and parking lots can become contaminated with oil, fertilizers, pesticides, chemicals, feces, and other pollutants. Subdivision regulations often add to runoff problems by requiring features such as wide streets, piped drainage, double sidewalks, and paved driveways, all of which retard the infiltration of water into the ground. Most regulations require that runoff be collected in storm drains and disposed of in the nearest surface water channel. This approach to drainage management may lead to several problems. The most immediate effect of discharging storm waters into a stream may be downstream flooding. Subsequently, discharge of storm waters may not only

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degrade the water quality of the recipient stream, but may also prevent recharge of an underlying aquifer. Recent studies indicate that storm water runoff is a major contributor to water quality problems in Buzzards Bay.

Good subdivision regulations control the design of drainage systems through mechanisms such as detention basins, gas and oil traps, gravel driveways and road shoulders, dry wells for roof drains, retention of natural vegetation, reduced road sizes, and other methods to curb runoff. An example of this is a recently adopted bylaw in the Town of Westport, which allows for limited exceptions to the subdivision requirements for 26-foot-wide paved roads. In addition to these requirements for minimizing runoff, the towns of Bourne and Falmouth specifically address aquifer recharge in their subdivision regulations.

- Bourne

"To the maximum extent feasible, stormwater shall be recharged rather than piped to surface waters."

- Falmouth

"To the maximum extent feasible, stormwater shall be recharged rather than piped to surface waters, and no drainage structure should be installed within 100 feet of any natural water body or wetland."

The Falmouth bylaw also allows the Planning Board to require an Environmental Impact Statement (EIS) to address the nutrient loading of a proposed subdivision, the carrying capacity of the receiving waters, the existing condition of the water body or supply, and the expected change in condition as a result of the proposed development. The information provided by the EIS may allow a more intensive review of large projects which may have a range of impacts, such as pollution from septic system effluent, fertilizers, and runoff. Falmouth's regulations also may allow the Board to require an EIS to estimate other probable impacts on the quality of surface waters or drinking water supplies.

Planning boards in each community should review their subdivision regulations, and consider incorporating the following provisions:

- To prevent the degradation of surface waters, depletion of groundwaters, and flooding problems, stormwaters should be kept on site and allowed to percolate through the soils.
- Detention basins should be required to collect runoff from catch basins and drains. Pipes used to transport stormwater should deposit water into detention basins, not into surface waters.
- Perforated pipes may be required in cases where it is necessary to recharge underlying aquifers.
- Roof areas should be required to drain into dry wells.
- Parking lot runoff should be required to be collected in catch basins, equipped with oil and gas traps and directed to a detention area. These traps must be maintained to be effective.
- Regulations should limit the amount of impervious surface which contributes runoff by reducing roadway width and length requirements, and by encouraging gravel driveways and gravel road shoulders. They should also require that the post-development peak runoff be equal to pre-development runoff quantities.
- Runoff should also be minimized by requiring that the developer retain natural vegetated buffer zones.
- These conditions should be included in subdivision regulations, or be formally adopted as planning board standards.

Earth Removal

State law (MGL Chapter 40, Section 21 (17)) authorizes local bylaws and ordinances to regulate earth removal and to require permits from a local board. The Zoning Act authorizes the regulation of earth removal activities

under home rule zoning powers, for the purpose of conserving natural resources and the appropriate use of land. Earth removal may impact ground and surface water quality by removing the natural filter system of vegetation and soils. Often earth removal operations mine large areas of sand and gravel. These materials are very important in the recharge of aquifers and the cleansing of storm water. Key regulation provisions relevant to water quality address the following:

- depth to the water table allowed;
- maximum slope allowed;
- revegetation of the site; and
- other provisions to reduce erosion.

In the Buzzards Bay region, earth removal regulation is by zoning or general bylaws. These require that earth removal activities be authorized by permit issued by the selectmen, or by a special permit granting authority. In some cases, bylaws require permits to be issued by the zoning board of appeals, soil board, planning board, or building inspector.

All of the 16 municipalities except Acushnet and Gosnold have some form of earth removal regulation. These regulations exempt earth removal activities included in construction authorized by building permit, cemetery operations, and agricultural activities (i.e. cranberry bogs, landscaping, and nurseries). Also exempted are small-scale earth removal projects, generally defined as those displacing less than 50 cubic yards of earth over a 12-month period (individual regulations vary from 5 to 50 to 100 cubic yards).

Earth removal regulations may address nuisances such as dust, noise, traffic, and erosion problems. Most regulations require a site plan, depicting existing and proposed grade and drainage as well as material storage areas. Most regulations also specify the following conditions in which a site must be left in order to control erosion:

- grade--maximum grade is specified as 1' to 2' or 1' to 3';
- loaming--minimum replacement topsoil depth varies from 2" to 4" to 6";
- planting/seeding--perennial vegetative cover must be restored.

These regulations may be enforced by means of a surety bond. Some regulations allow the permitting authority to specify the above conditions (and any others) on an individual basis.

Erosion control measures are important to surface water quality because increased sedimentation of streams, ponds, or bays is damaging to finfish, shellfish, and vegetation and may actually alter the depth, width, shape, and course of a waterway. Earth removal regulations addressing depth to water table allowed are especially important, because removal of earth below the water table directly exposes groundwater to contamination. In addition to the aforementioned erosion control requirements, the towns of Fairhaven and Falmouth address the protection on groundwater:

- Fairhaven's regulations specify: "No gravel shall be removed within six feet of spring high water table. This elevation shall be established from a test pit and the level related to a permanent monument on the property."
- Falmouth's regulations state: "The depth of any earth removal shall be limited to a plane that is at least 10 feet above the seasonal high groundwater level for that location, unless the purpose is to create a pond."

Each municipality should review their earth removal regulations, and consider incorporating these additional provisions to prevent degradation of water quality from earth removal activities:

- set maximum depth from the seasonal high water table for earth removal;
- require strict erosion control measures to be implemented during the entirety of earth removal operations;
- require grading and set maximum slope for a site following earth removal;
- require a minimum depth of loam and revegetation of the site with native perennial plants and trees;

- other requirements which will ensure that the site is left in such a condition that it will be suited for the land use for which it is zoned;
- these conditions should be built into the bylaw or zoning regulation, or formally adopted as standards by the permitting authority.

Landfills

Landfills are regulated under M.G.L. Chapter 111, Section 150A, which provides for the establishment of regulations for solid waste disposal facilities by the Department of Environmental Quality Engineering (DEQE). Local Boards of Health are responsible for siting, operation, and maintenance of landfills, according to the regulations promulgated by DEQE. Regional DEQE offices are responsible for enforcing the regulations. The current state regulations for solid waste disposal, 310 CMR 19.00, address site assignment, approval of plans, daily operation, and closure of landfills. These regulations provide general guidance for landfill operators, but lack specific details to ensure adequate protection of water resources. Budget and staff restraints of DEQE further limit the effectiveness of state enforcement of landfills.

Landfills are regulated by municipal government through zoning, board of health site assignment and operation regulations, and by contract with the owner/operator (contractor). Regulations specify areas where landfills are permitted, acceptable types and generators of waste, hours of operations, and fees. These regulations may be set by town meeting (zoning amendments), boards of health, selectmen, and departments of public works.

Landfills are a statewide source of water pollution from commercial and household toxic wastes. These hazardous substances leach out with rainfall, eventually contaminating surface and groundwaters and drinking water supplies. Regulation provisions pertinent to water quality may include zoning which prohibits landfills in aquifer recharge areas or areas with highly impervious soils, the prohibition of dumping hazardous substances, and operation requirements to reduce and retain any contaminated effluent. The following municipalities have landfill regulations which address water quality protection:

- Bourne--Landfill regulations permit trash generated within town only; no toxic or hazardous liquid materials accepted; no auto parts or tires.
- Dartmouth--Zoning prohibits any private or commercial dumps or refuse plants. Landfills or refuse plants are allowed only where operated for Dartmouth municipal use or under a Regional Refuse District, of which Dartmouth is a member. These landfills or resource recovery facilities are allowed in general industrial districts, provided there are no toxic fumes, smoke, dust, odor, noise, or objectionable effluent. Regional facilities require a special permit from the board of appeals which may impose reasonable conditions to protect the environment.
- Fairhaven--Board of Health regulations permit the disposal of waste generated within town only. In addition, the following materials are prohibited: branches, bushes, roofing material, or other objects exceeding five feet in any dimension, sealed containers, hazardous chemicals or wastes, radioactive materials, whole tires, explosives, tree stumps, bulk fish by-products. The Board of Public Works may act as an agent to the Board of Health for the enforcement of these regulations.
- Falmouth--Town bylaw permits trash generated within town only. Separate areas are designated for rubbish, metals, and sewage. "Dangerous chemicals, hazardous wastes, explosive materials, or materials of unknown composition will not be accepted unless special arrangements are made with the department of public works and/or health or fire departments." The disposal area attendant may examine or reject any material he believes to be hazardous.
- Freetown--Board of health landfill regulations permit trash generated within town only; no burning or smoldering substances are allowed; no volatile or non-volatile inflammable liquids are allowed in the landfill or placed for pick-up by rubbish collectors. The board of health annually appoints a landfill foreman and assistant foreman.
- Mattapoisett--Board of health regulations permit trash generated within town only; no waste oil or toxic materials are allowed except at a waste oil deposit maintained by the board of health.

In addition, many communities have adopted aquifer protection or water resource districts which prohibit water pollution sources such as landfills within designated aquifer recharge areas. The following towns have adopted such zoning regulations:

- | | |
|-------------|-----------------|
| • Bourne | • Middleborough |
| • Dartmouth | • Plymouth |
| • Falmouth | • Wareham |
| • Marion | |

Although present zoning may prohibit new landfills in aquifer recharge areas, many existing landfills lie over important aquifers. Often these landfills were located in gravel pits, due to the accessibility of these areas and their ability to hold large amounts of refuse (i.e. Falmouth). However, these areas were often excavated down to the water table, thus allowing contaminants to enter the groundwater.

In other municipalities, landfills are not specifically addressed in the zoning bylaw, and may be allowed by special permit in general, unrestricted, or industrial districts. One problem with this is that zoning districts are often set according to past development trends, roadways, and available utilities. Water quality is often not considered in zoning, thus allowing potentially polluting landfills to be located in prime water resource areas. In the site assignment process, boards of health may require a hydrogeologic engineering study to properly assess impacts of a proposed landfill. Communities should review their existing landfills and expected future needs. The board of health or other appropriate board should consider adopting the following regulations:

- To extend the useful life of a landfill and to keep inappropriate materials out, the following is recommended:

—Communities should sponsor household hazardous waste pickups so that chemicals may be collected and properly treated by licensed companies.

—Communities should encourage recycling by providing collection areas for waste oil, paper, glass, and metals.

- Communities should provide separate areas for the disposal of brush, leaves, and other organic matter; these materials should be prohibited from the landfill because their decay produces acidic, oxygen-deficient conditions favorable for the leaching of metals and other contaminants.
- Each of the above recommendations should be combined with a program to educate the citizens about the importance of proper treatment of the waste which they generate.
- To plan for the proper siting of future landfills, zoning bylaws should prohibit the location of landfills in important aquifer recharge areas, within well recharge areas, and near wetlands. Landfills should be allowed only in areas with appropriate clay soils and hydrological conditions.
- The board of health should adopt regulations for landfill operation, monitoring, and remedial action.
- All landfills should be enclosed and secured with chain link fencing to prevent illegal dumping.
- Supervisors should be trained by DEQE in all aspects of landfill operation.
- Trained supervisors should be on duty all open hours to review materials being placed in the landfill, and to inspect any suspicious containers. The supervisors should be authorized to refuse questionable materials, and report this to DEQE.
- Permanent observation wells should be required down-gradient from all landfills (abandoned and operating) to detect any leachate leaving the site.
- Remedial action plans should be required to allow quick response and corrective action for any groundwater contamination discovered through the monitoring program.

- To reduce the potential of groundwater contamination from abandoned landfills, the board of health should require that these landfills be properly capped to minimize the infiltration of precipitation and subsequent leachate.
- To reduce the risk of groundwater contamination from poorly sited landfills, these landfills should be closed and capped as soon as an alternative can be found.

Subsurface Sewage Disposal

The Division of Environmental Quality Engineering (DEQE) is authorized, by M.G.L. Chapter 21A Section 13, to regulate sewage disposal systems. In 1977, DEQE adopted the current regulations under Title V of the State Environmental Code. These regulations were designed as a minimum health standard to protect water supplies from bacterial contamination, and to ensure adequate siting and design of sewage disposal systems. Regulations include requirements for the type and capacity of systems, location, installation, and maintenance.

Title V states that each sewage disposal system shall be located and installed in such a way that "it will function in a satisfactory manner and will not create a nuisance or discharge into any watercourse". In determining a suitable system location, the size, topography, drainage, groundwater level, water supplies, and soil classifications of the site must be considered. Site examination, deep observation holes, and percolation tests are used to determine if the lot is suitable for the proposed system. There must be at least a four (4) foot depth of naturally occurring pervious soil below the entire area of the leaching facility. Title V allows percolation tests to be performed at any time of the year. Maximum time limits are set for water to percolate through the soil. Soils with a percolation rate of over 30 minutes per inch are considered impervious, and therefore unsuitable for the subsurface disposal of sewage.

Title V specifies the minimum distance of sewage disposal facilities (septic tank and leaching facility) from wells, surface water supplies, and watercourses. Watercourse is defined within Title V as any natural or manmade stream, pond, lake, wetland, swamp, or other body of water where flowing or

standing water or ice provide a significant part of the supporting substrate for a plant community for at least five months of the year. Septic tanks must be at least fifty (50) feet from wells or surface water supplies, and twenty-five (25) feet from watercourses. Leaching facilities must be at least one hundred (100) feet from wells or surface water supplies and fifty (50) feet from watercourses. The 100-foot minimum distance from leaching facilities to sources of drinking water supply was set because bacteria may travel up to ninety feet through soils.

Under M.G.L. Chapter 111 Section 31, Boards of Health may adopt regulations to supplement Title V. Title V was designed as a minimum health standard to protect against bacterial contamination. Board of Health regulations may strengthen these standards to better address local conditions and water quality problems. Regulations may include requirements to protect water resources from nutrient (nitrogen and phosphate) and chemical wastewater pollutants as well as bacterial pollutants. Many of the Buzzards Bay drainage basin communities have adopted local regulations to supplement Title V including: restrictions of percolation tests to the wettest season; increases in setbacks of sewage systems from the water table, water supplies and water courses; restrictions on septic system additives; and the prohibition of on-site sewage disposal systems in flood hazard areas, areas of shifting sand, or areas of high water table.

Title V allows Boards of Health to order property owners to have their sewage disposal systems cleaned or repaired to keep the systems in proper operational condition. Generally this is done when a system fails and becomes a public nuisance. The 1978 208 Wastewater Management Plan recommended that Boards of Health adopt septic system maintenance programs to include mandatory preventative pumping and inspection of sewage systems. These recommendations were not carried out in any of the Buzzards Bay communities. The 208 Plan also suggested that Boards of Health require low-flow plumbing fixtures to reduce the wastewater burden of septic systems. These preventative measures are currently done on a voluntary basis.

Many municipalities, such as Bourne, Carver, and Plymouth, have regulations for the upgrading of pre-Title V systems. These Board of Health regulations

specify that with any repairs or alterations to existing sewage systems and any repairs or alterations to more than fifty (50) percent of a structure, the existing sewage disposal system must be brought into compliance with Title V. Regulations may also specify that if repairs or alterations to a structure will cause a greater volume of sewage to be discharged, the disposal system must meet Title V requirements.

Title V was designed to ensure that wastes would flow through the ground and be filtered by the soils as they moved off the site. However, in some areas where the soil is sand, gravel, or other highly porous mixtures, the wastes may flow too quickly through the ground and into ground or surface waters. To account for this, towns have adopted the following health regulations:

- Middleborough

Board of Health regulations state, "If the percolation rate is under 5 minutes per inch drop, the minimum acceptable distance for a well site shall be 200 feet from any subsurface sewage disposal area. Based upon the examination of the soil and estimate of the depth and slope of the water table, the Health Officer may grant a variance indicating a lesser distance, to not less than 100 feet, providing that the examination indicates that the installation of the said well will not endanger the health of any potential user."

- Bourne

Board of Health regulations state that coastal beaches, dunes, banks, barrier beach systems, and coastal lands subject to flooding are areas characterized by active sediment transport and highly fluctuating groundwater table. These are "hazard prone areas in terms of potential public health and safety problems relating to drinking water quality, shellfish and fisheries contamination, and personal life and property damage". The installation of new septic systems is prohibited in any area where there is active shifting sands or earth, or where the distance from naturally occurring ground elevation (exclusive of all fill materials) to observed high ground water elevation is less than 6 feet.

Bourne's regulations include increasing the setback of systems above the groundwater table from 4 feet, as required in Title V, to 6 feet. Other municipalities have addressed this setback in their health regulations as follows:

- Carver

"The filling of land ordinarily submerged during any portion of the year, in order to provide for sufficient area to make it suitable for building, is not considered an acceptable practice, and such lands are considered unsuitable from a sanitary point of view for human habitation. Swamps shall be neither drained or filled." However, fill may be used to raise the base of the leaching area to meet Title V requirements.

- Plymouth

These regulations, like Carver's, prohibit filling of wetlands to obtain sufficient area for building. They also prohibit filling to raise the leaching area. "The filling of land in order to provide the four (4) foot minimum distance between the bottom of the disposal system and the maximum groundwater elevation is not considered as an acceptable practice, and such lands are considered as not suitable from a sanitary point of view for human habitation."

Boards of Health should consider adopting regulations to supplement Title V and address local water quality problems. There is much discussion of the best way to modify Title V so that it addresses nutrients and other pollutants. Arbitrarily increasing Title V setbacks is not the best or most efficient method. Bourne's health regulation prohibiting sewage systems in areas of shifting sands or high groundwater level helps to tailor sewage disposal regulations to the unique characteristics of coastal areas.

Wetlands

The Massachusetts Wetlands Protection Act, M.G.L. Chapter 131 Section 40, is administered locally by conservation commissions. The Act requires a permit for the alteration of any wetlands defined in the regulations. Commissions may

allow, deny and/or impose conditions based on the protection of specified wetland functions: public or private water supply, groundwater supply, flood control, storm damage prevention, prevention of pollution, protection of land containing shellfish, protection of fisheries, or protection of wildlife habitat. In addition to the state Wetlands Protection Act, municipalities may adopt bylaws or ordinances which supplement local authority of the state law by increasing the protected boundaries or functions of wetlands (example: erosion control, recreation, or aesthetics could be added). Municipalities may also choose to protect wetlands by adopting zoning bylaws which designate wetland areas and their allowable land uses.

- Carver--zoning overlay district: primary function is flood control; no structures, earth removal, or dumping without special permit; permit applications reviewed by conservation commission, board of health, and town engineer.

- Dartmouth--two zoning overlay districts: inland wetlands and watershed protection district and the coastal wetlands district; no permanent structures for human occupancy or structures with sewerage facilities; no earth removal or filling, and no changes in water courses without special permit; conditions for special permits are specified.

--Town bylaw to protect wetlands and adjoining land areas by controlling activities likely to impact wetland values. Wetland values include, but are not limited to, the functions specified in the Act, erosion and sedimentation control, recreation, aesthetics, agriculture, and aquaculture values. This bylaw allows the Conservation Commission to require a bond, deposit, or other form of security to ensure that all provisions set forth in the Order of Conditions are met. The bylaw also allows police and other municipal officers to assist the Commission in enforcement. Violation of this bylaw is punishable by a fine of not more than \$300 for each day of each violation.

- Falmouth--zoning wetlands regulations: any destruction, filling, dredging, or alteration of shoreline, wetland, water course, or body of water requires a special permit from the board of selectmen.

—Town bylaw to protect the town's wetlands and foreshores; modeled after the state Wetlands Act, it includes wildlife, erosion control, recreation, and aesthetics as protected wetland functions.

- Freetown--town bylaw to protect the town's wetlands and foreshores; modeled after the state Wetlands Act, it includes wildlife, erosion control, recreation, and aesthetics as protected wetland functions.
- Wareham--town bylaw to protect the town's wetlands and foreshores; modeled after the state Wetlands Act, it includes wildlife, erosion control, recreation, and aesthetics as protected wetland functions.
- Mattapoisett--board of health regulation: requires board of health approval for any building within 200 feet of the Mattapoisett River; board reviews pollution and surface drainage controls.
- Middleborough--zoning overlay district of areas with poorly drained soils: no structures for human occupation or structures with sewerage facilities without special permit; development conditions for special permits are specified.
- Plymouth--zoning overlay district of areas with poorly drained soils, barrier beaches and tidal flats: residential and other structures require special permit; regulations specify conditions for special permits; earth removal or filling is prohibited.

In general, local wetland regulations are designed to reduce the damage incurred by flooding and protect water-related resources (drinking water, shellfish, finfish, wildlife, aesthetics, and recreation). The prohibition of permanent structures is intended to reduce flood damage. The prohibition of structures having water and sewerage facilities is designed to reduce pollution. Wetlands overlay districts address the special conditions which occur in wetland areas. These conditions may then be made subject to appropriate requirements imposed in the permit process. Wetlands zoning districts and bylaws are a useful tool to delineate areas unsuitable for development, and to preserve valuable water resources. These regulations guide growth and encourage appropriate land use. Municipalities should adopt wetland

or aquifer overlay zoning districts encompassing major wetland areas and important groundwater resources. These districts overlay existing zoning and add land use restrictions. In addition, municipalities should adopt wetland bylaws similar to Dartmouth's new bylaw, which further defines the Conservation Commission's authority by including provisions for security and local enforcement.

Aquifer Protection

The last decade has seen an increased awareness of the vulnerability of surface and groundwaters, and the need to protect those resources. Municipalities may designate aquifer protection districts through zoning, ordinances, or bylaws. These regulations can limit specified activities or land uses which may be detrimental to water quality. Aquifer protection districts may be determined by hydrologic study of the watershed and recharge areas for public, private, and potential water supplies. These districts are delineated on a map and usually overlay existing zoning districts, adding land use requirements specific to water quality. By incorporating water resource protection into their zoning, municipalities may encourage appropriate land use within the watershed areas, and ensure high quality and sufficient quantity of drinking water supplies.

In the study area, half of the sixteen municipalities have aquifer protection or water resource zoning districts. These regulations specify: permitted uses, prohibited uses, special permit uses, and design and operation guidelines for activities in the aquifer protection district. The following are examples:

Bourne

● Prohibited Uses

Sanitary landfills, junkyards, municipal sewage treatment facilities with on-site disposal of secondary treated effluent, car washes, road salt stockpiles, outdoor storage of more than 100 tons of coal, and any other use which involves as a principal activity the manufacture, use, storage, transportation, or disposal of toxic or hazardous materials.

- Special Permit Use (authorized by the planning board)

Storage or transportation of oil or gasoline, rendering impervious more than 40 percent of lot area, retention of less than 30 percent of lot area in its natural state, and any use exceeding 15,000 gallons sewage per day or involving any hazardous waste in quantities greater than those of the normal household.

- Special Permit Criteria

"...groundwater quality resulting from on-site waste disposal and other on-site operations will not fall below federal or state standards for drinking water, or, if existing groundwater quality is already below those standards, on-site disposal plus natural recharge will result in no further deterioration."

- Design and Operations Guidelines--Single-family dwelling exempt. Safeguard provisions to protect against hazardous materials discharge, waste disposal systems located outside the district when feasible, all runoff must be recharged on vegetated surfaces on the site.

Dartmouth

- Area 1=municipal wells area of influence (cone of depression) non-intensive uses allowed such as conservation, outdoor recreation, agriculture, and maintenance of existing structures.
- Area 2=primary recharge areas to both existing wells and potential groundwater development areas.

Prohibited uses: disposal of solid wastes, storage or disposal of hazardous wastes, mining, automotive service or repair shops, junkyards, storage or use of deicing chemicals, more than 10 percent lot area impervious, outdoor storage of petroleum, and approval needed for the alteration of any natural site features or topography.

Fairhaven--Nasketucket River Basin District

- Special Permit (Restricted) Uses

Underground storage of fuel, commercial laundries or cleaners, road salt storage or application, commercial parking lots, commercial garages, pesticide storage or application for commercial purposes, fertilizer storage or application for commercial purposes, subsurface discharges of leachable wastes, storage of manure, storage or disposal of hazardous materials, commercial earth removal, junkyards and landfills.

Falmouth

- Prohibited Uses

Junkyards, solid waste disposal, public sewage treatment facilities with on-site disposal of effluent (unless tertiary treated), car washes, commercial laundries, trucking or bus terminals, airports, commercial accommodations and subsurface storage of fuel or hazardous chemicals in corrodible containers.

- Special Permit Uses

Any commercial or industrial use involving the use or storage of potentially hazardous materials in amounts greater than for ordinary household use. The applicant must demonstrate that any proposed use will not degrade current or future public water supplies.

- Design Requirements

Runoff must be directed towards vegetated areas for surface infiltration. Catch basins and piped storm sewers may be used only where other methods are infeasible.

On-site disposal systems should be located outside the District when feasible. Sewage may not exceed 7.5 gallons per day per 1,000 square feet of lot area.

Marion

- Permitted Uses

Single-family residence connected to the municipal sewer and located on a minimum of one acre.

- Prohibited Uses—(existing uses exempt)

Outdoor storage of salt, snow-melting chemicals, pesticides, herbicides, chemicals or hazardous materials; junkyards, landfills, disposal of hazardous materials or wastewater, manufacture of pesticides, herbicides and fertilizers, and commercial facilities for the storage or treatment of hazardous waste.

- Special Permit Uses

All other uses not otherwise prohibited.

Middleborough

District A—watershed and recharge areas for a public water supply

- Permitted Uses

Outdoor recreation, storage of heating oil within buildings it will heat, agriculture (provided that fertilizers, pesticides, herbicides, manure, and other leachable materials are not stored uncovered), and residential uses (provided that no more than 25 percent lot is impervious and no less than 50 percent lot is maintained as natural vegetation).

- Prohibited Uses

Disposal of solid wastes other than brush, disposal of leachable wastes (except domestic wastewater less than 880 gallons per day per lot), on-site disposal, treatment or storage of hazardous substances, junkyards,

landfills, dumping of snow, mining, underground storage of petroleum products, storage of road salt or other deicing chemicals, application of fertilizers, pesticides or herbicides for non-domestic and non-agricultural uses, and any structure or land-disturbing activities except those associated with passive recreation or wetland dependent uses.

- Special Permit Uses

All those uses not otherwise prohibited, authorized by the board of selectmen.

District B=natural water resources integral with public, private, or potential water supplies.

- Prohibited Uses

On-site treatment, disposal, or underground storage of hazardous substances, and any structure or land disturbing activity except those associated with passive recreation or wetland dependent uses within 100 feet of listed watercourses.

- Special Permit Uses

Disposal of solid wastes other than brush, disposal of leachable wastes (except normal domestic sanitary wastewater disposal), landfills, outside fuel storage, junkyards and garages.

Plymouth

- Area 1=municipal wells area of influence (cone of depression).
- Area 2=primary recharge areas to existing or proven future municipal wells.
- Area 3=primary recharge areas to recreational lakes, waterbodies or tributaries thereof.

- Prohibited Uses in Areas 1, 2 and 3

Disposal of solid wastes other than brush, storage of petroleum in such a way that a rupture could result in direct leakage into the ground, disposal of wastewater leachate wastes (except normal domestic sanitary wastewater disposal), the use of septic system cleaners which contain toxic chemicals, rendering impervious more than 25 percent of any lot, outside storage of road salt or deicing chemicals, dumping of snow from outside the District, earth removal or filling, junkyards, and the storage or disposal of hazardous wastes.

In addition to the water resource protection districts, the towns of Fairhaven, Marion, Mattapoisett, and Rochester are members of the Mattapoisett River Valley Water Supply Protection Advisory Committee. Formed by the state legislature, the committee advises planning boards of the member towns on development within the Mattapoisett River Watershed. Development proposals within the watershed must be reviewed by the committee, and its findings or recommendations reported to the planning board or other town agency having such jurisdiction.

Communities should actively pursue a program of water supply protection, and consider the following measures:

- Important water resources should be mapped, including municipal wells area of influence, primary recharge areas to existing or potential future municipal wells, high yield aquifer areas, and other natural water resources integral with public or private water supplies.
- These mapped areas should be used as the basis for an aquifer protection overlay zoning district(s). Within these districts, uses which could potentially pollute the aquifer should be prohibited (see examples of restrictions on previous pages).
- Within a community, it may be helpful to set up an Aquifer Protection Advisory Committee composed of citizens, to submit comments and recommendations on proposed development.

Harbor Regulations

Cities and towns may regulate boats or other marine vessels in municipal waterways by ordinances and bylaws. The board of selectmen may establish requirements for boat moorings and operation. Generally a harbormaster is appointed by the selectmen or mayor to enforce these regulations and oversee harbor activities. Harbor regulations typically address the safe operation of boats through requirements for moorings, speed, obstruction of channels, seaworthiness, fishing, waterskiing, swimming, diving, and refueling. Penalties for the violation of harbor regulations are usually a fine of \$100 or less and/or a loss of mooring privileges for each offense.

Regulations pertinent to water quality include restrictions on discharges of sewage, petroleum products, and trash. Holding tank and pumpout requirements and the prohibition of trash or oil discharges are implemented to prevent pollution which may add toxins and pathogens to the water, thus damaging shellfish and finfish resources and restricting swimming or other shoreline activities.

The Federal Water Pollution Control Act, PL 92-500, Section 312, gave the Environmental Protection Agency authority to promulgate performance standards for marine sanitation devices (MSD's) on recreational and commercial vessels. The Coast Guard has responsibility for enforcement of this law, and regulations require certification of MSD's and prohibit the direct discharge of sewage. These regulations have had only minimal success in dealing with the problem of overboard discharge. Enforcement of the regulations has been difficult, due to Coast Guard budget and staff restraints.

Another problem has been the reluctance to enforce the marine sanitation device regulations because of a lack of adequate pumpout stations. In Buzzards Bay, there are few pumpout facilities. Requirements for onshore collection and treatment facilities for MSD wastes also occur in M.G.L. Chapter 91, Section 59B. This law requires that marinas provide facilities for the collection, treatment, and disposal of sanitary waste. The DEQE Division of Water Pollution Control, which licenses marinas, is charged with the enforcement of this law. No regulations have yet been promulgated for this program, although there is discussion of including them in the new proposed Chapter 91

regulations. As with the federal law, budget and staff restraints limit enforcement.

Most municipalities have set limits or moratoriums on the number of moorings to control harbor crowding and pollution. Other municipal harbor regulations follow:

- Fairhaven

- Town bylaw enforced by the board of health, the regulations cover any town waters--streams, lakes, marshes, bays, or waterways. This bylaw must be posted at all marinas.
- The discharge of sewerage, garbage, or other contaminants from marine craft into any town waters is prohibited.
- All marinas must have an annual permit from the board of health. All marinas must provide adequate toilet facilities, potable water supply, and garbage containers which meet board of health requirements.
- It is the boat owner's responsibility to be sure that marine heads are not used when the boat is berthed. These facilities must be kept locked or sealed when berthed, and adequate toilet facilities provided on shore.
- Houseboats used as residences are prohibited from docking unless approved by the board of health.
- Board of health members, agents, or representatives may board any boat to determine whether or not a pollution violation exists.

- Falmouth

- Selectmen's regulations enforced by the harbormaster.
- The discharge of oil, raw sewage, dead fish, garbage, or debris of any kind into the waters, shores, or beaches of the town is prohibited.

- Houseboats which are not self-propelled are prohibited from mooring at any town-owned marina. Vessels used as a residence, unless equipped with approved waste treatment systems, may not remain overnight or be used as a residence in any Falmouth harbor.

- Plymouth

Town harbor bylaw enforced by the harbormaster. The discharge of untreated sewage, rubbish, debris, oil, or dead fish into Plymouth harbor is prohibited.

- Wareham

- Selectmen's regulations prohibit the discharge of oil, dead fish, garbage, or debris on the fresh or salt waters, shores, or marshes of the town. These regulations are enforced by the harbormaster.
- Board of health regulations require all marinas to have holding tank facilities for the collection, treatment, and disposal of sewage waste.

Water quality related harbor regulations are difficult to enforce for several reasons. The large areas involved and the shortage of officials make enforcement infrequent and spotty. In many towns there is one person who must perform all the duties of the harbormaster, and in some towns the harbormaster also serves as the shellfish officer. Enforcement is further complicated by the difficulties in proving the source of water pollution discharge, which may be a land or water source. As difficult as they are to enforce, harbor regulations are needed to balance the many uses and protect the valuable resources of each town's harbors and waterways.

The following are recommendations for coastal communities:

- Selectmen or the mayor should hire a harbormaster to patrol waterways for violations of harbor regulations. This position should be full-time at a minimum during the boating season.

- Boards of health should adopt regulations requiring marinas to install and maintain pumpout facilities for the collection, treatment, and disposal of sewage waste.
- Boards of health should adopt regulations requiring boatyards to install and maintain catch basins to remove anti-fouling paint sediments from boat cleaning effluents.

Shellfish

The Massachusetts Department of Environmental Quality Engineering (DEQE) conducts water quality testing and classifies shellfish growing waters. If water quality is below the SA classification, it is deemed unsuitable for shellfishing and is closed by the division of Marine Fisheries (DMF). Local shellfish officers may set additional closures for propagation or reclamation of shellfish. Commercial shellfishermen must obtain a state permit to be eligible to sell their catch. Municipal permits are needed to fish within town waters. Municipalities issue several types of permits--family or recreational and commercial. These permits specify allowable areas for shellfish harvesting, methods, and catch limits.

Shellfish are an important economic resource and food source of Buzzards Bay. Massachusetts General Law Chapter 130, Section 52 authorizes municipal regulation of shellfish. Local regulations are generally set by the board of selectmen, in accordance with the recommendations of their appointed shellfish officer or marine commission. These regulations address the quantity and method of shellfish harvesting, who may harvest in municipal waters, and the restriction of shellfish areas. Shellfish regulations are enforced by the shellfish officer, police officers, and the selectmen or their designee.

Local regulations require a permit for the taking of clams, quahogs, oysters, and scallops within municipal waters. Some towns also regulate the taking of eels, mussels, conchs, and seaworms. All local regulations reflect state statutes prohibiting the harvesting of seed shellfish according to the following standards:

- clams must be at least 2" long
- quahogs must be at least 2" long
- scallops must show an annual growth ring
- oysters must be at least 3" long

Seed shellfish (those below this minimum size) must be returned to the water. Shellfish officers set the allowable season, days of the week and hours for harvesting, and catch limits based on state requirements and local conditions. Shellfish officers may inspect the permit and catch of anyone harvesting shellfish. Most municipalities have specified landing sites where shellfish must be brought (in their shells) for inspection. Violators may be fined and/or their permits revoked or suspended. Highlights of municipal shellfish regulations are as follows:

- Bourne

- Use of shovels for shellfish harvesting is prohibited;
- No dredges, tongs, rakes, or boats may be used for harvesting oysters;
- Beach and marsh grasses or peat bogs may not be removed;
- All starfish, conchs, or green crabs which are caught must be placed in containers provided at the town landing or landfill;
- All scallop shells and entrails must be placed in the designated area at the town landfill.

- Dartmouth

- Diving for shellfish for commercial purposes is prohibited.

- Falmouth

- No oysters may be taken until further notice;
- Diving for shellfish is prohibited.

- Marion

- Use of shovels or hoes for shellfish harvesting is prohibited;
- All holes dug while shellfishing must be filled;

- Beach and marsh grasses may not be dug up;
- Regulations limit scallop dragging in the inner harbor;
- All starfish, winkles, and their egg strings taken must be placed on the shore at Old Landing;
- All shells and residues must be deposited in designated covered containers at Old Landing or the town dump;
- All permit holders must submit a monthly catch report to the shellfish warden;
- Limits on commercial scalloping include a 36-inch width 40-pound weight maximum for drags.

- Mattapoisett

- Diving for shellfish is prohibited;
- All starfish, winkles, and their egg strings taken must be placed above the high water mark.

- Plymouth

- Diving for scallops is allowed only under family use permits;
- Harvesting under family use permit is allowed by dip net or rake only;
- Limits on commercial scalloping include a 22-foot maximum boat length and a 36-inch maximum dredge width;
- Commercial permit holders must submit monthly catch reports accompanied by copies of dealer receipts;
- Limit of 5 commercial scallop permits.

- Wareham

- No bull rakes or drags may be used to harvest under a family permit;
- No clams may be harvested under a family permit;
- Dry digging of quahogs is prohibited;
- Commercial permit holders must submit monthly catch reports;
- All predators are to be brought to shore.

- Westport

- Clams and oysters may be harvested by hand, rake, tongs, or dip nets;
- Scallops may be harvested by dredge or any of the above means;
- Dredges may be no wider than 36 inches;
- Destruction of shellfish beds, aquaculture areas, or marshland is prohibited;
- Starfish, drills, winkles, and their egg cases must be placed above the high water mark.

These regulations are a combination of resource protection (size, method, and catch limitations) and predator control (disposal of starfish, crabs, etc.) intended to protect the shellfish resources of Buzzards Bay. In addition, the towns of Bourne, Dartmouth, and Mattapoisett have developed shellfish management plans which go beyond licensing regulations. These plans address the conservation, propagation, transplantation, and reclamation of shellfish. Westport and Fairhaven have draft management plans, while New Bedford has a state-approved management plan for moderately contaminated areas. Shellfish management plans identify primary shellfish areas, factors which have reduced the species of shellfish, and steps needed to improve shellfish resources.

Agriculture

The following section focuses on pollutants generally associated with agriculture. However, animal waste, fertilizers, and pesticides which may cause bacterial, nutrient, and chemical contamination may originate from commercial and household usage.

Local regulations regarding animals generally support state law and are enforced by the board of health or the selectmen. MGL Chapter III, Section 31 authorizes boards of health to make reasonable health regulations and to publish and enforce these regulations. Chapter III, Section 155 authorizes boards to license stables and "make such regulations or orders as in its judgement the public health requires relative to drainage, ventilation, size, and character of stalls, bedding, number of animals, and storage and handling of manure".

Provisions pertinent to water quality include the proximity of animals to water bodies or wells and manure storage practices. Contamination of surface or groundwaters by manure can be a serious yet preventable problem. This nitrate pollution can damage shellfish and finfish resources, drinking water supplies, and the recreational value of waterways. Of the sixteen municipalities in the study area, six have board of health regulations which govern farm animals. The remainder have regulations for the licensing and/or restraint of dogs only.

- Bourne's regulations specify that stables be located at least "...250 feet from the high water mark of any source of drinking water supply or tributary thereof or any open waters flowing directly or ultimately into any source of water supply". Bourne also requires stables to have a sanitary drainage system connected to either the public sewerage system or a subsurface sewerage disposal system meeting the requirements of Title 5 and the board of health. In addition, manure must be stored in a ventilated watertight storage facility of concrete or other durable material.
- Carver's regulations require animal shelters to be at least 100 feet from the high water mark of any source of drinking water supply or tributary thereof, and at least 100 feet from wells. Manure is required to be disposed of in a manner consistent with good management practices. Carver's board of health has established separate regulations for pigs, which require 250 feet setback for pens or manure piles from the high water mark of water supply sources. Manure spread for cultivation must be plowed under within 48 hours.
- Dartmouth's regulations include a 100-foot setback of manure storage from any watercourse.
- Fairhaven's regulations may require drainage facilities to prevent the contamination of surface water or groundwater. In addition, to prevent bank erosion and water contamination, animals must be restricted from having access to surface water bodies. Regulations also require that manure be stored in a manner which will prevent the contamination of surface and groundwaters.

- Falmouth's regulations require waste matter to be disposed of at the discretion of the board of health.
- Freetown's regulations for horses do not address water quality. The regulations pertaining to pigs specify that manure storage and pens be at least 250 feet from the high water mark of any waters flowing ultimately into a source of water supply.

Agricultural, commercial, and home use of fertilizers may lead to nutrient-laden leachate and runoff. Examples of this potential problem may result from heavy applications of chemical fertilizers to farmland, golf courses, and lawns.

Pesticides, insecticides, fungicides, rodenticides, and herbicides are regulated by the Massachusetts Pesticide Control Act. The Act controls the distribution and application of toxic pesticides. Local boards of health may request that those practicing agriculture within the municipality submit as annual report stating the types and quantities of pesticides used. However, some prohibitions on the use of pesticides may be invalid as an improper restriction upon agriculture. Non-agriculture pesticide uses, such as the use of herbicides on utility rights of way, lawns, and golf courses may be regulated by municipalities for the protection of public health and safety, providing that local regulation is in compliance with state law. Most domestic use of these products is limited by restricting those pesticides sold without an applicator's license, and by requiring labels specifying application instruction and warnings.

The Town of Bourne has adopted the following board of health regulations: "The use of those chemicals, listed as pesticides, herbicides, rodenticides, and fungicides, which have been identified as being possible contaminants to groundwater or public health, be prohibited except where a special permit for such use has been granted by the Board of Health". Application for a special permit must be made 45 days prior to the proposed commencement of the activity. Agricultural users are exempt from obtaining special permits. Home use of such products is exempt from this regulation. Agricultural users of such products shall submit a report of chemicals used and amounts applied.

These non-point sources of water pollution can be minimized by the following methods:

- Best Management Practices (BMP) for agriculture, including:
 - contour plowing,
 - retention of vegetated surfaces to reduce runoff flow,
 - manure storage sheds,
 - minimum setbacks for animal pens and waste storage areas from surface waters and wells,
 - use of non-chemical pest control methods and Integrated Pest Management (IPM) methods,
 - use of the least toxic pesticide needed to control the pest,
 - use of pesticides only when pest population deems use necessary for control.
- Boards of Health should require that all commercial users of pesticides submit an annual report showing the chemicals and amounts used.
- Where wetlands are involved, the Conservation Commission may restrict the use of pesticides and fertilizers through an Order of Conditions.
- Communities should sponsor educational programs for residents on the proper use of pesticides and fertilizers (i.e. gypsy moth control, lawn and garden care).

Hazardous Substances

Hazardous substances include a wide range of toxic materials which are regulated by state and federal law, but for which there is little local authority. The Massachusetts Hazardous Waste Management Act (MGL Chapter 21C) is the state version of the federal Resource Conservation and Recovery Act (RCRA). The Act sets up a system for tracking all hazardous waste ("cradle to grave" monitoring), standards for handling and disposing of wastes, and permit requirements. Under Chapter 21C, DEQE must provide the local board of health

with a copy of each permit or license application for a facility for the collection, storage, treatment, or disposal of hazardous waste. Also, on an annual basis, DEQE must provide the local board of health with information on the types and quantities of hazardous waste generated, stored, treated, or disposed of within the municipality. The board of health is responsible for notifying local authorities of this information.

The Hazardous Substances Disclosure by Employers Act, MGL Chapter 111F (the Right to Know Law) authorizes the chief executive officer of each town or city to designate a Right to Know municipal coordinator. The coordinator may have access to confidential DEQE information on hazardous substances used or stored at workplaces within the municipality in order to investigate public health concerns. Citizens may also petition for information, through the Right to Know Coordinator, if they believe that the presence of hazardous substances may be endangering public health and safety.

Most municipalities have attempted to prohibit facilities for the storage or disposal of hazardous and radioactive wastes. Many towns and cities have adopted zoning provisions prohibiting uses which would be detrimental, noxious, or offensive, or tend to reduce property values in the same or adjacent districts. Several municipalities have aquifer or water resource protection zoning districts which prohibit the use of storage of hazardous materials within the district. Others, such as Dartmouth and Freetown, have adopted bylaws which broadly prohibit radioactive waste or hazardous waste facilities within the town. Broad local prohibitions may be invalid if they exclude a land use throughout the municipality, or if they conflict with state regulations. For example, hazardous waste facilities are licensed by the state, hospitals are permitted to generate radioactive waste, and cranberry growers are licensed to apply certain pesticides to bogs.

The local authority in regulating hazardous substances is still unfolding and being refined. As a general rule, municipalities may enact regulations more strict than corresponding state regulations, if the purpose is within the intent of the state law; however, local regulation may not prohibit an activity authorized by the state. Communities should do the following to encourage proper handling and disposal of hazardous wastes:

- Land use decisions and zoning should be based on scientific reasoning of soil suitability and hydrology.
- Household hazardous waste pickups should be held annually (see Landfill).
- Municipalities should appoint a hazardous waste coordinator to oversee hazardous waste management and act as a liaison with DEQE.
- Potential dumping sites such as landfills, gravel pits, empty lots, rural roads, and water bodies should be secured or watched over. Educational programs should be sponsored to make people aware of the problem of illegal dumping and who they should report these to. DEQE cannot enforce the law if it is unaware of violations; local officials and citizens must act as watchdogs.
- Any accidental spill or hazardous waste emergency should be reported immediately to DEQE's Office of Incident Response. No cleanup should be attempted without approval and technical advice from DEQE (see Hazardous Waste Handbook--A Guide For Local Officials, SRPEDD).

Cities and towns have regulatory and enforcement obligations for matters concerning public health, safety, and welfare, even where state and federal agencies have authority over hazardous materials. These broad powers should be applied, and will be upheld if they do not conflict with state or federal laws and if they are based on scientific fact and reasoning.

